

PROCEEDINGS
OF
THE ROYAL SOCIETY.

~~~~~

November 15, 1883.

Professor T. H. HUXLEY, President, in the Chair.

In pursuance of the Statutes, notice of the ensuing Anniversary Meeting was given from the Chair.

The Rev. Percival Frost and Mr. Howard Grubb were admitted into the Society.

General Boileau, Professor Crofton, Mr. Hind, Dr. W. Pole, and Dr. Rae, having been nominated by the President, were by ballot elected Auditors of the Treasurer's Accounts on the part of the Society.

The Presents received were laid on the table and thanks ordered for them.

The following Papers were read:—

- I. "*Mahonia Aquifolia* as a Nurse of the Wheat Mildew (*Puccinia graminis*).” By CHARLES B. PLOWRIGHT, M.R.C.S. Communicated by Sir J. D. HOOKER, F.R.S. Received July 23, 1883.

It has always been difficult to account for the widely-spread nature of outbreaks of wheat mildew in districts in which the common barberry is either entirely absent or very uncommon. In the year 1874 the Rev. James Stevenson found at Glamis, in Forfarshire, an *Æcidium* upon *Mahonia aquifolia*, which the Rev. M. J. Berkeley\* pronounced to be *Æcidium berberidis*. In the following year Dr. Paul Magnus† found the same fungus at Lichterfelde, near Berlin, but since that time it does not seem to have been noticed by any one. On the

\* Berkeley and Broome, "Annals Nat. Hist.," Jan., 1875.

† Magnus, "Botan. Verein der Prov. Brandenburg. Sitzung.," 25 Juin, 1874. p. 76.

31st of May, 1883, Mr. William C. Little, of Stagsholt, March, gave me a freshly gathered specimen of *Mahonia aquifolia*, upon the berries of which the *Æcidium* was abundant. Knowing that upon the barberry no less than three different *Æcidia* occur, I determined to prove by direct experimental culture whether this one was the *Æcidium berberidis* of Persoon (the *æcidiospore* of *Puccinia graminis*). At 10 P.M. on the evening of the 31st May I placed some of the spores upon the cuticle of some wheat-plants which had been cultivated under a bell-glass. In eleven days the uredo of *Puccinia graminis* made its appearance upon these plants. The details of this, as well as of two other experiments, are appended. On the 13th June I placed some of the *æcidiospores* upon a piece of wheat cuticle; in twelve hours they had germinated, and a little later the germ-tubes were seen entering the stomata, in the same manner as those of *Æcidium berberidis* do (see figure). It is then clear that the *Æcidium* upon *Mahonia aquifolia* is identical with the *Æcidium berberidis* (Pers.), and is a part of the life-cycle of *Puccinia graminis*, and is unconnected with the *Æcidium magellanicum* (Berk.),\* and the *Æcidium* of *Puccinia berberidis* (Mont.).†

The *Mahonia* in question is widely cultivated in gardens throughout England and is a favourite evergreen in shrubberies. It is also extensively planted in woods as a covert for game.

*Experiment 151.*‡—Four wheat seedlings, grown in a flower-pot, which have been continuously covered by a bell-glass since the seed was planted (at the end of April), had on 31st May the spores of the *Æcidium* on the fruit of *Mahonia aquifolia* applied to their green leaves. The bell-glass was replaced as soon as this was done. On the 10th of June on two leaves pustules of uredo were observed. On the 19th these plants were gathered. Every one of them had the uredo upon it.

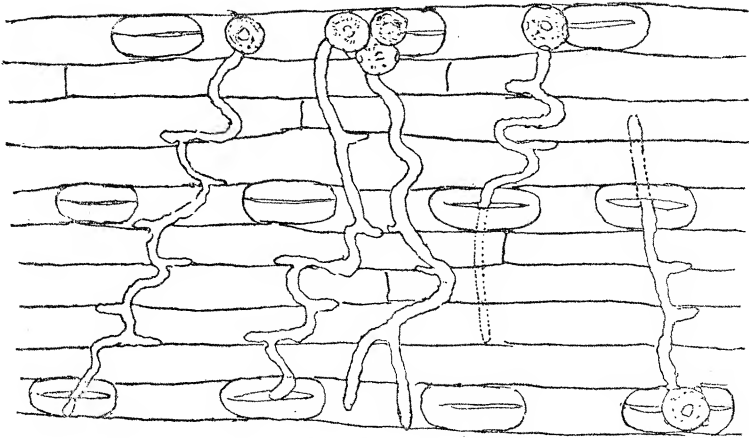
Six precisely similar wheat seedlings, planted at the same time and grown under the same conditions, as control plants, were perfectly free from uredo, and remained so up to the present time (19th June).

*Experiment 152.*—Three wheat-plants, grown by "water culture" in a room in the house, were removed from the bottle in which they were growing and planted in a flower-pot on the evening of the 31st of May. To their leaves the spores of the *Æcidium* on *Mahonia* were also applied as in the former experiment. On the 8th of June the presence of the mycelium of the uredo was indicated by the appearance of sickly yellow spots upon the leaves, and on the 10th the perfect uredo of *Puccinia graminis* was developed.

\* Hooker, "Flora Antarctica," vol. ii, p. 450, Pl. 163, fig. 2.

† Montagne Gay, "Flor. Chil.," VIII, p. 46. "Sylloge," p. 314.

‡ The numbers refer to a series of experimental cultures made during the past three years upon the physiology of the Uredines.



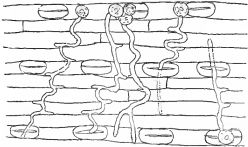
Spores of *Aecidium* on *Mahonia aquifolia* germinating upon the cuticle of a wheat plant : showing the germ-tubes entering the stomata.

*Experiment 162.*—A wheat-plant, grown out of doors in the parish of West Lynn, was placed in a flower-pot in April. On the 31st of May this plant was removed to my garden, near King's Lynn, and covered by a bell-glass. The plant was far more robust and considerably larger than those employed in the former experiments. On the 2nd of June it was infected with fresh *aecidiospores*, sent by Mr. Little from Stagsholt. The bell-glass was removed on the 5th, and on the 10th of June the uredospores of *Puccinia graminis* made their appearance. On the 19th there were thirteen stems of this wheat-plant, about 18 inches in height; fourteen leaves were affected with uredo. There were many wheat-plants, of all ages, growing at this time in the garden, but upon no one of them did any *Uredo linearis* exist.

## II. "Description of Teeth of a large Extinct (Marsupial?) Genus, *Sceparnodon* Ramsay." By Professor OWEN, C.B., F.R.S. Received October 2, 1883.

(Abstract.)

In this paper the author describes teeth of a new genus of Mammal, representing a species of the size of the *Thylacoleo* or *Nototherium*, specimens of which teeth have been discovered in three distinct and remote localities in Australia. In shape the teeth resemble the scalpriform incisors of the upper jaw of the *Rodentia*; in the microscopic structure of the dentine there is a nearer resemblance to that in the incisor of the large extinct form of wombat (*Phascodomus*). Figures of the teeth, and of their dentinal structure mag-



Spores of *Ecidium* on *Malva sylvestris* germinating upon the cuticle of a wheat plant : showing the germ-tubes entering the stomata.